

RHINO PSB24-BCM960S BATTERY CONTROL MODULE

READ INSTRUCTIONS BEFORE INSTALLING OR OPERATING THIS DEVICE. KEEP FOR FUTURE REFERENCE.

General Description

The PSB24-BCM960S battery control module is designed to support a 24V system with up to 40A output and 4.5 minutes back up time for 15AH battery capacity. It offers a wide input voltage from 24-28V and a wide operating temperature range from -20°C to +60°C. This product comes with dry contacts for battery management signals and LED indicator for battery status. The rugged compact aluminum case is shock and vibration resistant according to IEC 60068-2.

IMPORTANT SAFETY INSTRUCTIONS

- Retain these instructions. This manual contains important safety instructions.
 - When replacing batteries, only use the same type of batteries as described in the Specifications.
 - Proper disposal of batteries is required. Refer to the relevant local codes for disposal requirements.
 - Switch main power off before connecting or disconnecting the device. Risk of explosion!
 - If the orange status LED is on steady, this indicates a failure in the installation. In this case, do not turn on power supply while the battery is connected. Danger of explosion!
 - To guarantee sufficient convection cooling, keep a distance of 50mm above and below the device as well as a lateral distance of 20mm (for vertical mounting) or 50mm (for horizontal mounting) to other units. See Figure 4.
 - Please note that the enclosure of the device can become very hot depending on the ambient temperature and load of the power supply. Risk of burns!
 - The mains power must be turned off before connecting or disconnecting wires to the terminals!
 - Do not introduce any objects into the unit!
 - Dangerous voltage present for at least 5 minutes after disconnecting all sources of power.
 - This is a built-in unit and must be installed in a cabinet or room (condensation free environment and indoor location) that is relatively free of conductive contaminants.
- CAUTION: FOR USE IN A CONTROLLED ENVIRONMENT.**



Risk of electrical shock, fire, personal injury or death.

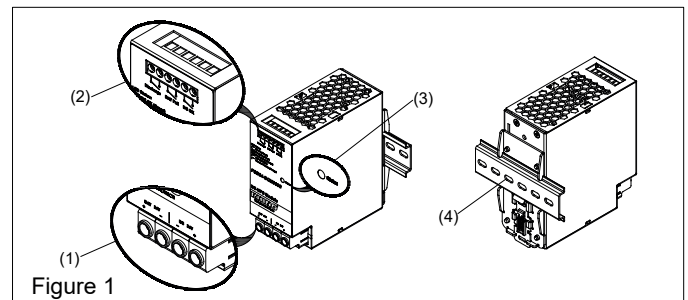
1. Turn power off before working on the device.
2. Make sure the wiring is correct by following all local and national codes.
3. Do not modify or repair the unit.
4. Use caution to prevent any foreign objects from entering into the housing.
5. Do not use in wet locations.
6. Do not use the unit in area where moisture or condensation can be expected.



Highlights & Features

- Full corrosion resistant Aluminium chassis
- Suitable for 24V system up to 40A
- Built-in diagnostic monitoring for DC OK, Discharge and Battery Fail by relay contacts
- LED indicator for DC OK, Battery Fail, DC Input, Battery Reverse Polarity and Battery Discharge
- High MTBF > 500,000 hrs as per Telcordia SR-332
- Wide operation temperature range from -20°C to +60°C
- Conformal coating on PCBA to protect against chemical and dust pollutants

Device description (Fig. 1)



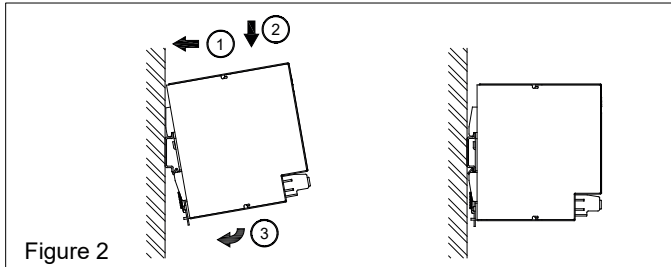
- (1) Input & Output/Battery terminal block connector
- (2) Signal terminal block connector
- (3) LED display status
- (4) Universal mounting rail system

FOR TECHNICAL ASSISTANCE CALL 770-844-4200

Mounting

The unit can be mounted on 35mm DIN rails in accordance with EN60715. For vertical mounting, the device should be installed with Input & Output/Battery terminal block on the bottom. For horizontal mounting, the device should be installed with Input & Output/Battery terminal block on the left side.

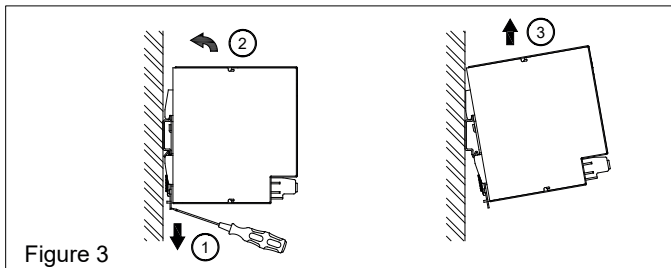
Each device is delivered ready to install.



Snap on the DIN rail as shown in Fig. 2:

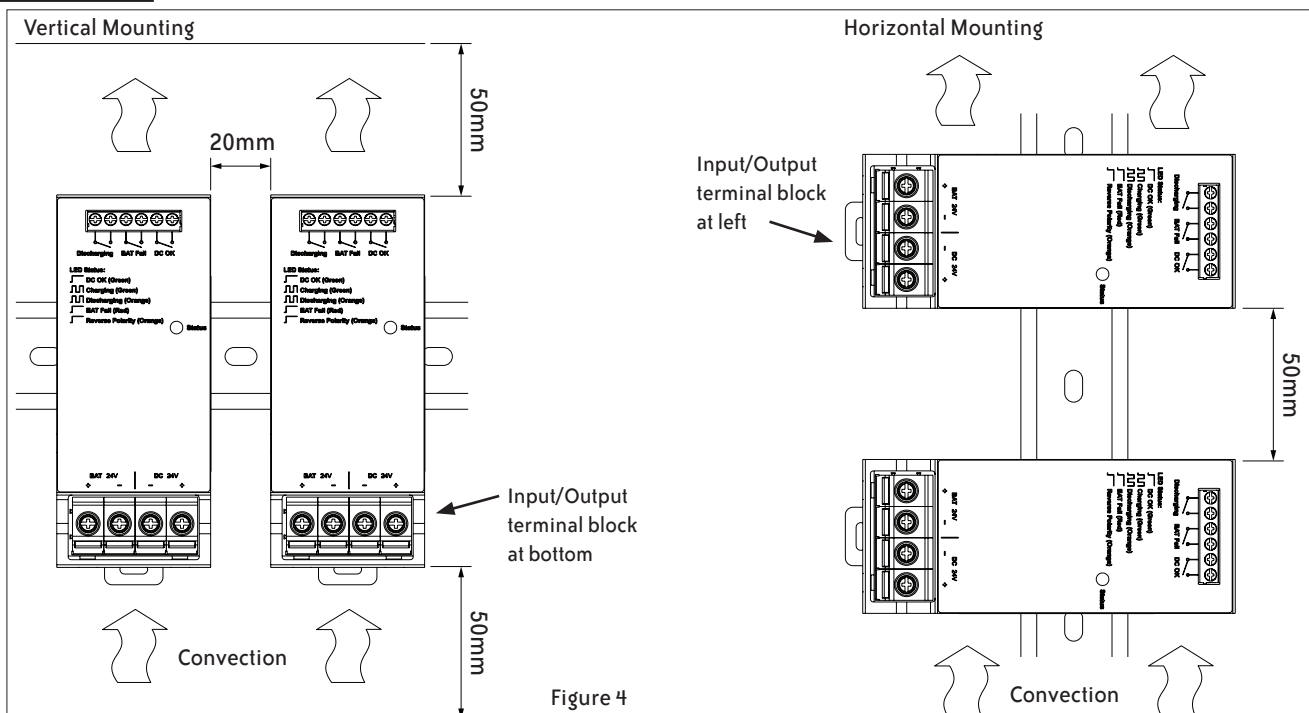
1. Tilt the unit slightly upwards and put it onto the DIN rail.
2. Push downwards until stopped.
3. Press against the bottom front side for locking.
4. Shake the unit slightly to ensure that it is secured.

Dismounting



To uninstall, use a flat screwdriver to pull or slide down the latch as shown in Fig. 3. Then, slide the PSU in the opposite direction, release the latch and pull out the PSU from the rail.

Orientation



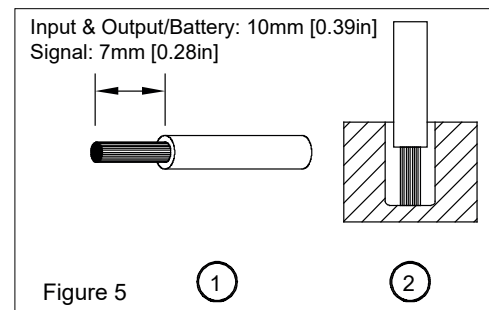
Connection

The terminal block connectors allow easy and fast wiring. The terminal block is IP20 compliant and thus provides the user safety and protection from electrical shock hazards.

You can use flexible (stranded wire) or solid cables as follows:

	Stranded / Solid		Torque		Remarks
	mm ²	AWG	N·m	lb·in	
Battery	3.3-13.3	12-6	1.52	13.5	Load: 0-20A
DC In/Out	8.4-13.3	8-6	1.52	13.5	Load: 20-40A
Signal	0.2-3.3	24-12	0.61	5.4	-

Wires between the battery control module and battery must not be longer than 2m [6.5 ft]. For reliable and shockproof connections, the wire stripping length should be 10mm for Input & Output/Battery terminal block connector and 7mm for Signal terminal block connector (see Fig. 5 (1)). Please ensure that wires are fully inserted into the connecting terminals as shown in Fig. 5 (2).

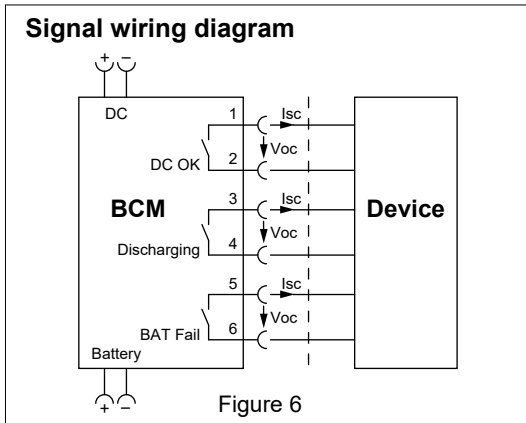


In accordance with EN60950 / UL60950, flexible cables require ferrules.

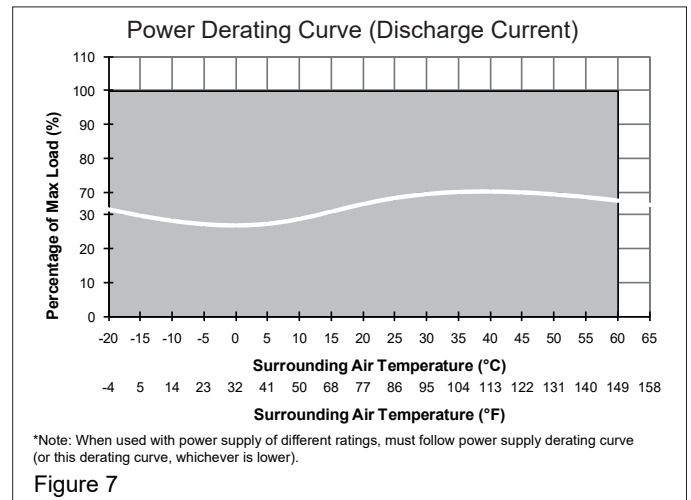
Use appropriate copper cables that are designed to sustain operating temperature of at least 60°C/75°C for USA or at least 90°C for Canada.

Signal wiring diagram

Contact current: $I_{max} = 1A$
 Contact voltage: $V_{max} = 24VDC/VAC$ (Secondary circuit)
 No polarity requirement.



Power Derating

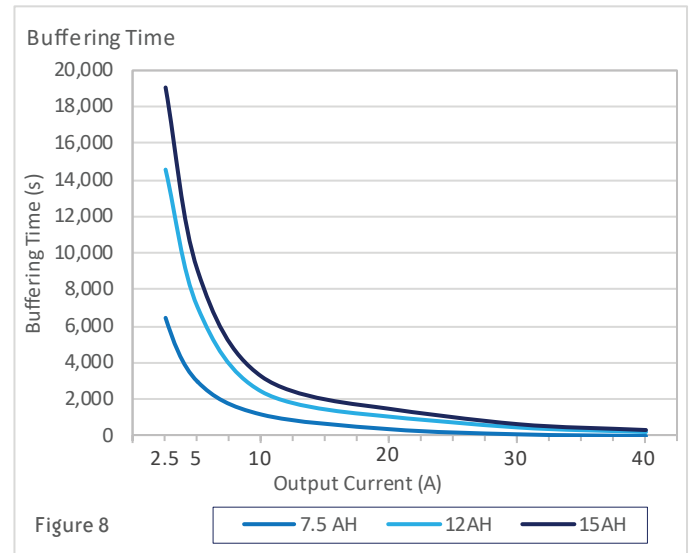


BCM Status	Relay Output Connector			LED Display Status
	Discharging	BAT Fail	DC OK	
Battery Fully Charged	Open	Open	Closed	Green LED On
Battery Charging	Open	Open	Closed	Green LED Flashing
Battery Discharging* (Buffering Mode)	Closed*	Open	Closed	Orange LED Flashing
No Battery Connected	Open	Closed	Open	Red LED On
Output Shutdown	Open	Open	Open	No Light

* With output current 3A to 40A.

Output Current	Buffering Time		
	7.5 AH	12AH	15AH
2.5 A	6,500s	14,500s	19,000s
5A	3,000s	7,000s	9,000s
10A	1,200s	2,400s	3,200s
20A	400s	1,100s	1,500s
30A	120s	450s	600s
40A	25s	200s	280s

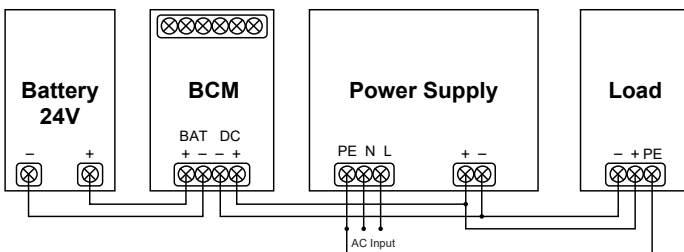
Buffering Time



Typical application notes

Typical Application Notes

9.1 Provide backup power during AC source interruption or failure



9.2 Can be combined with redundancy module (PSB60-REM40S)

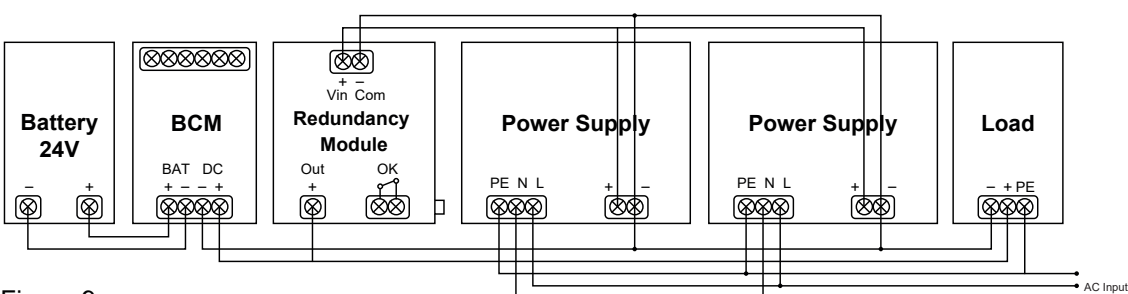




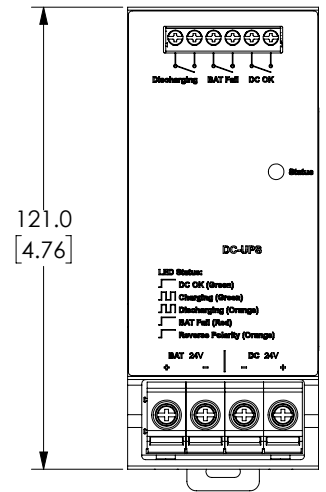
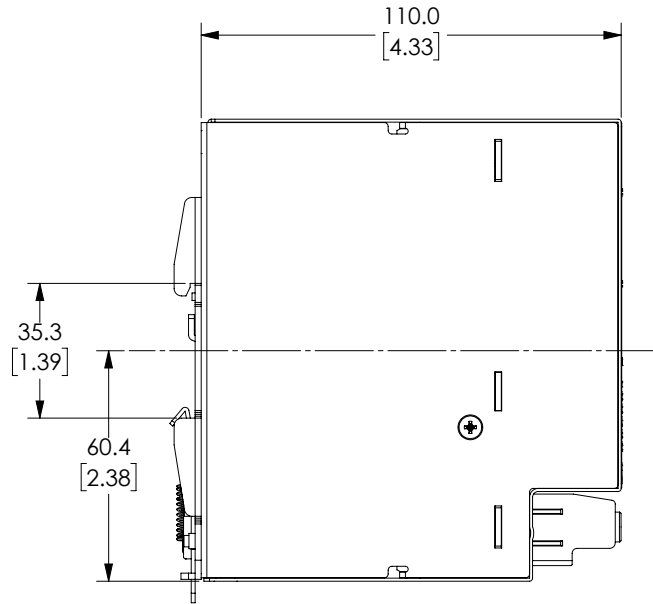
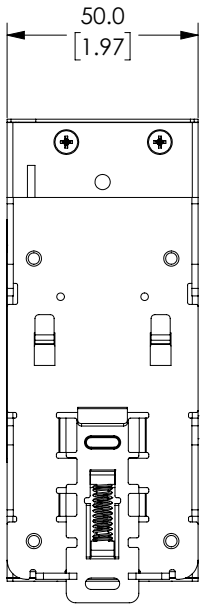
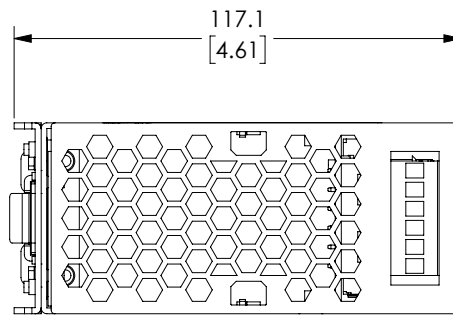


Figure 9

Technical Specifications		
Input (DC)		
Nominal input voltage		24VDC
Voltage range		24-28 VDC
Maximum input voltage		30 ± 0.5 VDC
Input current		Charging Mode: 2.0 ± 1.0 A (25°C), Discharging Mode: 40A Max.
Maximum inrush current (cold start)		< 45A (25°C)
Charging time		< 3 hr ± 1 hr (25°C)
Efficiency		Charging Mode: > 70.0%, Discharging Mode: > 99.0%
Output (DC)		
Nominal output voltage		24VDC typ. (depends on Vin)
Discharging voltage		23-28 VDC
Maximum output voltage		30 ± 0.5 VDC
Output current		40A Max.
Derating		Refer to Fig. 7
Component derating		Vin = 28.0 VDC, Max. load
Short circuit / Overload		No damage
Batteries		
Recommended battery types		24V VRLA or 2 x 12V VRLA
Recommended battery capacity		7.2-15.0 Ah
Battery voltage range		23-28VDC (continuous operating), 30VDC Max (maximum voltage that will not cause damage to the unit) 14VDC Min (voltage level of battery to enable "BAT Fail" function)
Battery fuse		Auto 50A / 80V, FK3 (Littelfuse) or similar in the battery path (protects the wires between the battery and the battery control module)
General Data		
Type of housing		Aluminum
LED signals		Green LED On = Unit is fully charged Green LED Flashing = Unit is charging Orange LED Flashing = Unit is discharging Red LED On = Battery fail (no battery is connected) Orange LED On = Battery 24 V or DC 24 V reverse polarity
Signal relay contacts		DC OK = Contact is closed when battery is fully charged and the unit is ready to discharge/buffer. DISCHARGING = Contact is closed when the unit is discharging/buffering with output current of 3-40 A. BATTERY FAIL = Contact is closed when the battery fails to function.
MTBF		> 500,000 hrs. as per Telcordia
Dimensions (L x W x H)		121mm x 50mm x 117.3 mm [4.76 in x 1.97 in x 4.62 in] (See www.AutomationDirect.com for complete engineering drawings.)
Weight		0.39 kg [14 oz]
Connection method		Screw connection
Stripping length		Input & Output/Battery terminal block connector: 10mm [0.39 in] Signal terminal block connector: 7mm [0.28 in]
Operating temperature (surrounding air temperature)		-20°C to +60°C [-4°F to +140°F] (Refer to Fig. 7)
Storage temperature		-25°C to +85°C [-13°F to +185°F]
Humidity at +25°C, no condensation		< 95% RH
Vibration (non-operating)		10Hz to 500Hz @ 30m/S ² (3G peak); displacement of 0.35mm; 60 min per axis for all X, Y, Z direction. Refer to IEC60068-2-6. Note: all figures quoted are amplitudes (peak values)
Shock (in all directions)		30G (300m/S ²) in all directions according to IEC60068-2-27
Pollution degree		2
Altitude (operating)		3000m
Certification and Standards		
Electrical equipment of machines		IEC60204-1
Electronic equipment for use in electrical power installations		EN50178 / IEC62103
Safety entry low voltage		PELV (EN60204), SELV (EN60950)
Electrical safety (of information technology equipment)		UL/C-UL recognized to UL60950-1 and CSA C22.2 No. 60950-1 (File No. E198298), CB scheme to IEC60950-1
Industrial control equipment		UL/C-UL listed to UL508 and CSA C22.2 No.107.1-01, CSA to CSA C22.2 No.107.1-01 (File No. 249074)
Protection against electric shock		DIN57100-410
CE		In conformance with EMC directive 2014/30/EU and Low Voltage Directive 2014/35/EU
Component power supply for general use		EN61204-3
Immunity		EN55024, EN61000-6-2 (EN61000-4-2, 3, 4, 5, 6, 8)
Emission		EN55032, EN55011
		   
RoHS Compliant		Yes
Safety and Protection		
Isolation voltage:	Input & Output / PE Signal / PE Input & Output / Signal	1kVAC 1kVAC 1kVAC
Polarity protection		Yes
Protection degree		IP20
Safety class		Class III

Dimensions

mm [inches]



Block Diagram

